



Jatropha curcas

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September 5, 2008
HI Bioenergy Master Plan Workshop

Background

- Native to Central America/Mexico
- Used traditionally as medicine, lamp oil, soap
- Spread by Portuguese explorers
- Commercialized in Cape Verde in 1800's
- Toxic when ingested (non-toxic varieties?)
- Life-span over 40 years
- Seeds contain 30-40% oil content
- 1 of over 170 species in *Jatropha* genus

Worldwide development

- Gaining in popularity throughout tropical/subtropical world
 - India
 - China
 - SE Asia
 - Africa
 - Central & South America



Commercialized production?

- Many vendors and agents are pushing commercial jatropha ventures around the world
- India & China have seen rapid expansion – expected to be millions of acres in the two countries by 2010 – government investment
- Philippines, African nations, Thailand, Myanmar, Indonesia, and others claim to have large acreage already under cultivation

‘Western’ contributions...

- Dr. Becker at University of Hohenheim in Germany - >10 years of dedicated R&D
- D1 Oils (UK), now a subsidiary of BP, has development projects in three continents
- Co-products, toxicities, breeding/selection, mechanization, etc.



Jatropha in Hawaii

- Documented in Hawaii by Bishop Museum as early as 1910
- Believed to be brought in by Asian and Portuguese immigrants for medicinal use
- Currently naturalized on parts of Big Island (from old worker camps)
- Sometimes found in people’s yards and in random overgrowth

R&D in Hawaii

- Need for determination of site suitability across the State
 - Leeward sites (w/ supplemental irrigation)
 - Upland sites (<3,000 elevation)
 - Windward sites (what is threshold for overwatering?)
 - Soils – sands, loams, lava soils, steep slopes, water-logged (heavy clays)
 - Detrimental wind effects
- Origins of seed, co-product isolation, methods to attain automation, selection of heavy yielders
- Water use

Field determinations

- Spacing
- Establishment
- Irrigation rates & frequency
- Induction of flowering
- Well-suited origins
- Uniform structure
- Oil contents x mgmt
- Potential for mechanization



Establishment – direct seeding?

- Transplanting throughout rest of world
- With drip irrigation, ability in Hawaii to direct seed
 - Fresh seed of high quality can give over 80% germ rate
 - Potential to adapt row planting equipment in future



Harvesting?

- Low labor cost around world provides environment for hand harvesting
- One worker can collect over 200 lbs of fruit in one day (8 hrs)
 - Not from soil surface
 - Imagine coffee harvesting
- Options for Hawaii:
 - Collect from ground after fruit drop
 - Remove from trees when mature
 - Biomass + fruit harvest
 - Shake trees
 - Collect from trees and ground in one pass
- **This is THE critical roadblock to production in Hawaii**

Moving forward...

- Co-product development
- Refining yield predictions
 - From a window of 150-350 gpa at maturity to a consistent 300+ gpa production scheme
- Increasing uniformity in structure and yields of individual trees across large plantings
- Providing high-quality planting materials
- Engineering new equipment
- Incentivizing production

More information

- Visit <http://tpss.hawaii.edu/biofuel/>
- Contact me @ mpoteet@harc-hspa.com or (808) 292-9724
- Data on:
 - Early yields
 - Water use
 - Mgmt strategies
 - Fertilization
 - Seed availability

